

Claims

- [c1] 1)An aqueous based drilling fluid containing an effective amount of a tar sand anti-accretion additive selected from (i) a phosphonate, (ii) a phosphate ester of alkanolamine or (ii) mixtures thereof.
- [c2] 2)The fluid from claim 1 where the phosphate ester is the mono and di phosphate ester of monoethanolamine.
- [c3] 3)The fluid from claim 1 where the phosphate ester is the mono and di phosphate ester of diethanolamine.
- [c4] 4)The fluid from claim 1 where the phosphate ester is the mono and di ester of triethanolamine.
- [c5] 5)The fluid from claim 1 where the phosphonate is ATMP.
- [c6] 6)The fluid from claim 1 where the phosphonate is HEDP.
- [c7] 7)The fluid from claim 1 where the phosphonate is EDTMPA.
- [c8] 8)The fluid from claim 1 where the phosphonate is DTMPA.

- [c9] 9) The fluid from claim 1 where the phosphonate is BHMTMPMA.
- [c10] 10) The fluid from claim 1 where the tar sand anti-accretion additive is present at a concentration of at least 0.1% by weight of the drilling fluid.
- [c11] 11) The fluid from claim 1 where the additive is neutralized to a pH of 7 to 10.
- [c12] 12) a tar sand anti-accretion additive for drilling fluids to limit accretion of tar sands on metal surfaces comprising: at least one of (i) a phosphonate and (ii) a phosphate ester of alkanolamine.
- [c13] 13) an based-based drilling fluid comprising at least one of (i) a phosphonate and (ii) a phosphate ester of alkanolamine in an amount effective to reduce tar sand accretion.
- [c14] 14) an based-based drilling fluid comprising an effective amount of a tar sand anti-accretion additive for drilling fluids selected from the group consisting of a phosphonate, a phosphate ester of alkanolamine or mixtures thereof.
- [c15] 15) a method for drilling a wellbore through a tar sand-containing formation, the method comprising: operating

a drilling assembly to drill a wellbore and circulating an aqueous-based drilling fluid through the wellbore as it is drilled, the aqueous-based drilling fluid including an amount of at least one of (i) a phosphonate and (ii) a phosphate ester of alkanolamine effective to limit tar sand accretion on metal surfaces.

[c16] 16) a method for limiting accretion on metal surfaces in contact with tar sand-containing formation, the method comprising: washing the metal surfaces with an aqueous-based drilling fluid, the aqueous-based drilling fluid including an amount of at least one of (i) a phosphonate and (ii) a phosphate ester of alkanolamine.

[c17] 17) a method for removing accretion from metal surfaces in contact with tar sand-containing formation, the method comprising: washing the metal surfaces with an aqueous-based drilling fluid, the aqueous-based drilling fluid including an amount of at least one of (i) a phosphonate and (ii) a phosphate ester of alkanolamine.